**4.4b The Fundamental Theorem of Calculus**

1. Explain in your own words the Fundamental Theorem of Calculus.

2. Explain in your own words the Average Value Theorem for Integration.

**Find the x value guaranteed by the MVT where the function equals its mean value.**

3. 4. 5.

**Find the average value of each function:**

6. 7. 8.

9. Apple introduced one of their first products and the profit in thousands of dollars over the first 6 months was approximated by the model , where time was measured from the first month for any profit (p).

a. Use the model to complete the table below and (arithmetically) find the average profit over the first 6 months

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| ***t*** | **1** | **2** | **3** | **4** | **5** | **6** |
| ***P*** |  |  |  |  |  |  |

b. Find the average value of the profit function by integration and compare your result with part a. (Hint: integrate on )

c. What, if any, is the advantage of using the approximation of the average given by the integral instead of the table. Remember the integral uses all values of time instead of just integer values of time.

10. **T/F** If a function is continuous on an interval, then the function is integrable on the interval. Explain why this statement is either true or false.